

NOMENCLATURE OF THE SPURRED-GENTIAN OF THE SOUTHWESTERN UNITED STATES AND NORTHWESTERN MEXICO, *HALENIA ROTHROCKII* (GENTIANACEAE)

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ABSTRACT

The names *Swertia recurva* Sm. and *Halenia recurva* (Sm.) C.K. Allen are typified by a specimen of a species native to Colombia. The correct name for the western North American species that has been called *H. recurva* is *H. rothrockii* A. Gray.

RESUMEN

Se tipifican los nombres *Swertia recurva* Sm. y *Halenia recurva* (Sm.) C.K. Allen por un espécimen de una especie indígena de Colombia. La especie de Norteamérica occidental la que ha se llamado *H. recurva* correctamente se llama *H. rothrockii* A. Gray.

Key Words: Arizona, Gentianaceae, *Halenia*, Mexico, New Mexico, nomenclature, taxonomy.

The southwestern spurred-gentian, formerly known as *Halenia rothrockii* A. Gray but since 1933 generally called *H. recurva* (Sm.) C.K. Allen, reaches the northern limits of its range in Arizona and New Mexico and is more widely distributed in the Mexican states of Chihuahua, Coahuila, Durango, and Sonora. The results of a study of the nomenclature of this species, the need for which became evident during research for the treatment of the Gentianaceae for the *Flora of North America North of Mexico*, are presented here.

Following its publication by J. E. Smith in 1816, the name *Swertia recurva* was for many years considered to be of uncertain applicability. Grisebach (1845) suggested that it might be synonymous with *Halenia gracilis* (H. B. K.) Griseb., a name correctly applied to a species native to Colombia and Ecuador, but he did not adopt the earlier epithet *recurva* for that species. Neither the name *S. recurva* nor any homotypic synonym thereof was accepted for any species until 1933, when Allen applied the new combination *Halenia recurva* (Sm.) C. K. Allen to the species of the southwestern United States and northwestern México that until then had been known as *H. rothrockii* A. Gray.

Smith (1816) based the name *Swertia recurva* on a specimen in the Linnaean herbarium, now designated LINN no. 327.6. As Smith cited no other specimens or literature, this specimen has consistently been accepted as the type, by authors including Allen (1933) and Wilbur (1984). It is labelled "*Swertiae corniculatae affinis*" in the lower left; "*Swertia recurva* Sm. in Rees's Cyclop." in the lower right; and "Escallon" in the upper right. In the original description of *S.*

*recurva*, Smith (1816) said that it had been "Collected in Mexico by Escallon, and sent to Linnaeus by Mutis." Its presence in Linnaeus's herbarium, which Smith had acquired in 1784, was thus attributed to José Celestino Bruno Mutis y Bosio, who is known to have sent Colombian (but not Mexican) specimens to Linnaeus. Antonio Escallón y Flórez was one of Mutis's students and botanical associates in Colombia. Much has been recorded of Mutis's career, and it is quite certain that he never collected specimens in Mexico. Less is known about Escallón, but there is no indication of his having been in Mexico.

A specimen at US designated "type collection," i.e., considered to be an isotype, was acquired in 1932 in a set of Mutis's specimens from MA. It bears a printed label with the heading "Plants of Colombia collected by José Celestino Mutis, 1760–1808," and the handwritten identification "*Halenia recurva* (Smith) Allen." At the bottom of the label is the printed subheading "Mutis' notes accompanying specimens at Madrid," followed by the handwritten transcription "*Swertia corniculata*."

The history of these specimens is paralleled by that of the types of some other names based on Mutis's collections from Colombia now at LINN with isotypes at US. The species now known as *Otholobium mexicanum* (L.f.) J. W. Grimes, which does not occur in Mexico, was given the name *Indigofera mexicana* by Linné filius (1782) although he gave its range as "Nova Grenada" [=Colombia, sometimes also including Ecuador and Venezuela]. Both Linné filius and Smith (1791) gave the range of *Atractylis mexicana* L.f. [*Lycoseris mexicana* (L.f.) Cass.] as "Mexico,"

although, according to John Pruski (note in w<sup>3</sup>TROPICOS, Missouri Botanical Garden Web site, 2004), the species is endemic to Colombia. Pruski gave the provenance of the type as Colombia and deemed "Habitat in Mexico" to be a "locality error by L.f." It appears that Linné filius applied the name "Mexico" to all or much of what was in his time mainland Spanish America, and that he was uncritically followed by Smith with regard to the provenance of specimens received from Mutis.

Smith's (1816) use of the term "Mexico," interpreted by later authors as denoting present-day Mexico, has been accorded primacy over all other evidence as to the provenance, and hence the identity, of the type of the name *Swertia recurva*. Shortly after Allen (1933) published her monograph, Ellsworth P. Killip pointed out that she had erred in citing Mutis as the collector of a specimen from Mexico (correspondence attached to isotype sheet at US). In her response (also attached to isotype sheet at US) she said that the specimen at US "may very well be part of the same collection, and hence from Mexico, not Colombia," quoting Smith as to the provenance of the holotype. Wilbur (1984) followed Allen in accepting Smith's statement that Escallón had collected the type in Mexico and given it to Mutis. He annotated the isotype at US "*Halenia recurva* (Sm.) C. K. Allen (*H. rothrockii* A. Gray)." K.B. von Hagen (annotations 2002, GH, MICH, NY, US) likewise accepted this premise and identified specimens from North America, including the holotype and isotypes of the name *H. rothrockii*, as *H. recurva*.

In view of the evidence that "Mexico" was incorrectly associated by Smith with specimens collected by Mutis in Colombia, it is appropriate to reconsider the identity and probable provenance of the type specimen of the name *Swertia recurva* independently of any a priori assumption that it must be of Mexican origin.

The *Halenia* species in northwestern Mexico and the southwestern United States, which I shall call *H. rothrockii* in the remainder of this discussion, differs from most other *Halenia* species in its widely divergent corolla spurs, which are slender, proximally horizontal and distally curved upward. However, in Colombia, where Mutis and Escallón botanized, there is another species with similarly slender, widely divergent spurs, *H. asclepiadea* (H. B. K.) G. Don (nomenclature and types discussed below). The name *Halenia cuatrecasasii* C. K. Allen is here considered to be a heterotypic synonym of *H. asclepiadea*. The type of that name (Colombia: Cundinamarca: Páramo de Chococontá, 2760–2830 m, *Cuatrecasas* 9657; holotype F, isotype NY) is likewise from Depto. Cundinamarca, Colombia, and the spurs are similar in shape and orientation to those of *H. asclepiadea*.

The Colombian *H. asclepiadea* and the North American *H. rothrockii* differ distinctly in growth form. *Halenia asclepiadea* is a rhizomatous perennial that usually produces several flowering stems in a cluster, sometimes accompanied by vegetative rosettes or stolon-like stems not flowering in the same season. This habit is evident in the holotype of the name *S. asclepiadea* at P-Bonpl. (Colombia: Cundinamarca: Juxta Santa Fé de Bogota, 1400–1700 hex., *Humboldt & Bonpland s.n.*), the isotype at US, and the isotype formerly at B, now represented by a photograph at F, as well as in more recent specimens. *Halenia rothrockii*, in contrast, is monocarpic, generally single-stemmed, with a slender tap root, as is well shown in the type collection cited below. The basal parts of the holotype of the name *S. recurva* at LINN indicate that the specimen is that of a perennial in which stolon-like non-flowering stems accompany the stems that are in flower. This specimen includes a stolon-like stem highly similar to one on the isotype of the name *H. cuatrecasasii*. The isotype at US also clearly represents a several-stemmed perennial, distinctly unlike *H. rothrockii* in habit and basal parts.

*Halenia asclepiadea* and *H. rothrockii* also differ in the shape of their floral parts. The calyx lobes of *H. asclepiadea* are triangular, tapering evenly from the base to the simply acute apex. Those of *H. rothrockii* are narrowly oblong with the sides parallel for much of their length, tapering rather abruptly in the distal one-third or less to a short-acuminate apex. The corolla lobes of *H. asclepiadea* remain wide for most of their length and are rather abruptly rounded to a strongly erose distal portion and a subacute apex, whereas those of *H. rothrockii* taper more gradually from near mid-length to an acuminate apex and have less prominently erose margins. Relatively wide-based, triangular calyx lobes characteristic of *H. asclepiadea*, and unlike those of *H. rothrockii*, are discernible in both the holotype and the isotype of the name *S. recurva*. The distal portions of the corolla lobes are not well spread out, but enough is visible of at least one corolla lobe of the holotype to support the identity of the specimen as *H. asclepiadea*.

Some published descriptions of the spurs of *H. asclepiadea* appear to be inconsistent with the appearance of the specimens studied by the respective authors. Gilg (1916) described the spurs of *H. asclepiadea* as "crassiuscula" and "dicken," and Allen (1933), in a key that closely followed Gilg's, described them as "thick." Of the three replicates of the type collection, the best-prepared specimen was the isotype at B, of which the extant photograph clearly shows flowers with relatively slender spurs similar to those of the type of the name *S. recurva*. The isotype at US, although of poorer quality, likewise shows slender spurs. The image of the holotype at P is

less clear in this respect, because of the condition of the specimen and the paper on which it is mounted and the excessive contrast in the microfiche, but it appears to represent the same species. It may be noted, moreover, that Allen (*in* Cuatrecasas 1942) described the spurs not only of *H. asclepiadea* but also of *H. cuatrecasasii* as thick, although those of the holotype and isotype specimens of the latter name likewise appear relatively slender.

Discrepancies in descriptions of the spurs of *H. asclepiadea* may be due in part to the apparent presence, pending further study, of two species of *Halenia* in Colombia with strongly divergent spurs, both of which have been identified as *H. asclepiadea*. The spurs of the plants called *H. asclepiadea* in this paper are ca. 1.5 mm in diameter near the base, proximally tapering abruptly but scarcely tapering otherwise. Those of other plants are relatively stout, ca. 2.5 mm in diameter at the base and tapering throughout their length, reminiscent in their shape, although not in their orientation, of the spurs of *Dicentra cucullaria* (L.) Bernh. This probably distinct species is well represented by *Uribe Uribe 5614* (F; image in "Neotropical Herbarium Specimens," Field Museum of Natural History Web site). The type collection of the name *S. recurva* is equated here with the first of these two entities.

From the evidence presented above, I conclude that the type of the name *Swertia recurva* Sm. represents the Colombian species now generally known as *Halenia asclepiadea*, and that the name *H. rothrockii* should be restored for the species in the southwestern United States and northwestern México.

***Halenia rothrockii*** A. Gray, Proc. Amer. Acad. Arts 11: 84. 1876.—*Tetragonanthus rothrockii* (A.Gray) A. A. Heller, Cat. N. Amer. Pl., ed. 1, p. 6. 1898. Type: USA, Arizona, Graham Co., Mount Graham, 9000 ft, Aug 1874, *Rothrock 733* [number lacking on some isotypes] (holotype GH!; isotypes F, ISC, MO!,

NY [image on Internet!], PH [microfiche!], US [image on Internet!])

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